TOWN OF NANTUCKET, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
MUNICIPAL OFFICE BUILDING • 188 MADAKET ROAD, NANTUCKET, MA 02554
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April 3, 2019

C. Elizabeth Gibson, Town Manager
Town of Nantucket
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RE: Environmental Leadership Goal #1 - Update

This report serves to provide an update to the progress on the environmental leadership goal #1 of the 2018 Nantucket Selectboard Strategic Planning Framework to 'Provide data-driven recommendations on island-wide solid waste management guided by principles of sustainability' by 2021. This goal's aspirational statement is that 'Nantucket residents and visitors share responsibility for the long-term sustainability of our beautiful island. We recognize our stewardship of the land, air, and water and work to ensure our community is resilient and self-sufficient. Other communities look to Nantucket to learn how to care for the natural environment.'

Background

Our Environmental Leadership Strategic Focus Group includes members from our Selectboard, Health, Natural Resources, and Sewer Departments, Wannacomet Water Company, Department of Public Works, Strategic Planning, and the Assistant Town Manager. Opportunities being reviewed include exploring options to proactively reduce solid waste, as well as planning for the future disposal needs for our island. Understanding our waste streams involves taking a deep dive into available data sources including but not limited to solid waste and recycling tonnage numbers generated by our facility scale house, Finance Department landfill user fee structures and historically collected revenues, as well as related state and local solid waste/recycling regulations such as the Massachusetts Department of Environmental (MADEP) waste ban, local waste hauler and single-use packaging regulations among others.

In pursuing these objectives, we note the following points that are not universally understood:

- Approximately 75% of our island's Municipal Solid Waste (MSW) is delivered to our 188 Madaket Road Solid Waste/Recycling facility via private haulers. This is a combination of residential and commercial solid waste.

- Only six private haulers are licensed by the Health Department. The current annual fee is $100.
- Private Haulers do not pay a tipping fee for Municipal Solid Waste (MSW).
- The Town pays to divert recyclable plastic to market.
- The Town does not receive revenue from Waste Options Nantucket (WON) for scrap metal.
- Newly constructed lined landfill Cell 3A was permitted by the MADEP specifically to accept residuals from our compost facility. By permit and regulation this landfill cannot except unprocessed MSW or construction & demolition debris (C&D) for disposal.
- Cell 3A is a cost-effective way to dispose of our industrial composter's residuals. DPW has analyzed the cost to ship compost residuals off-island on multiple occasions over the years. Currently on a per-ton basis, it would cost two to three times more to ship residuals off-island when compared to the cost to landfill even when factoring in design/permitting, construction, operation and leachate handling, closure, and post-closure costs. Disposal costs on the mainland spiked higher in 2018 with the closure of multiple large landfills in southeastern Massachusetts, and the rail-haul system that would deliver MSW to landfills in New York and Ohio is still under development. Simply stated, shipping our industrial compost facility residuals off-island would cost Nantucket millions of extra dollars per year, with exposure to further increases outside of our control due to capacity shortfalls in the region.
- Limited space exists at our 188 Madaket Road facility to create new lined landfill cells. Once the current Cell 3A reaches capacity (expected in ten years based on current practices) only one additional area with the same life-expectancy has been identified, but not yet designed or permitted. Nantucket's strategy to manage waste disposal in a cost-effective manner for the foreseeable future is to use existing and future landfill capacity as efficiently as it can.

Our island's solid waste/recycling program is currently configured utilizing a Materials Recovery Facility (MRF) to hand sort recyclable materials, a Construction & Demolition Debris (C&D) facility to handle hard-to-manage or bulky and construction/demolition materials, and an Industrial Composter to process MSW.

Recovered recycling materials are baled and shipped off-island to market. We currently pay to divert recyclable plastic, metal, C&D, mattresses, textiles, electronics, and tires, and we only receive revenue (shared 50/50 with Waste Option Nantucket (WON)) for recycled tin/aluminum and cardboard shipping boxes. See FY2018, Summary or Costs and Credits (attached).

Our composting operation follows two distinct paths; a leaf and yard waste drop-off pile, and our industrial composter. Leaf and yard waste (nutrient and chemical concerns here) and Composter (sludge cake and leachate concerns here). Compost products and mulch produced from materials delivered to our facility are available for FREE to homeowners by the facility entrance and to commercial entities in bulk quantities as follows:

$10/CY	**Composter Compost** (This compost material is a blend of Compostable (C) Waste with Leaf and Yard Waste)
$10/CY	**Leaf & Yard Waste Compost** (This compost material is created from Leaf & Yard Waste, Grass Clippings, and Wood Chips)
$15/CY	**Mulch** (This mulch material is created from double-ground and screened tree scraps)
$15/CY	**Top Soil** (made to order) (This material is created from Leaf & Yard Waste Compost and sand)

Despite our compost products significantly lower prices compared to equivalent commercially imported products ($45/CY for Loam/Topsoil and $145/CY for Compost/Planting Mix at Valero's), our revenue (shared 50/50 with WON) from compost sales remains remarkably low. Over the past two years the Town and WON sold only 1,400 CY of various compost products, resulting in a limited revenue of $17,000.00

Historically, potential customers of our products including primarily gardeners and landscapers have complained about compost materials being contaminated with glass and plastic. DPW and WON has worked to improve our products with additional fine screening to help remove these undesirable contaminants with good success, however, this amounts to only symptomatic treatment of a larger systemic problem with contamination in our compostable waste stream. The industrial composter has limited capability to process materials. After tumbling and traveling through the industrial composting tube for three days at up to 145°F, a mechanical rotary trommel screen separates compostable materials from non-compostable materials on the basis of size, but works imperfectly.

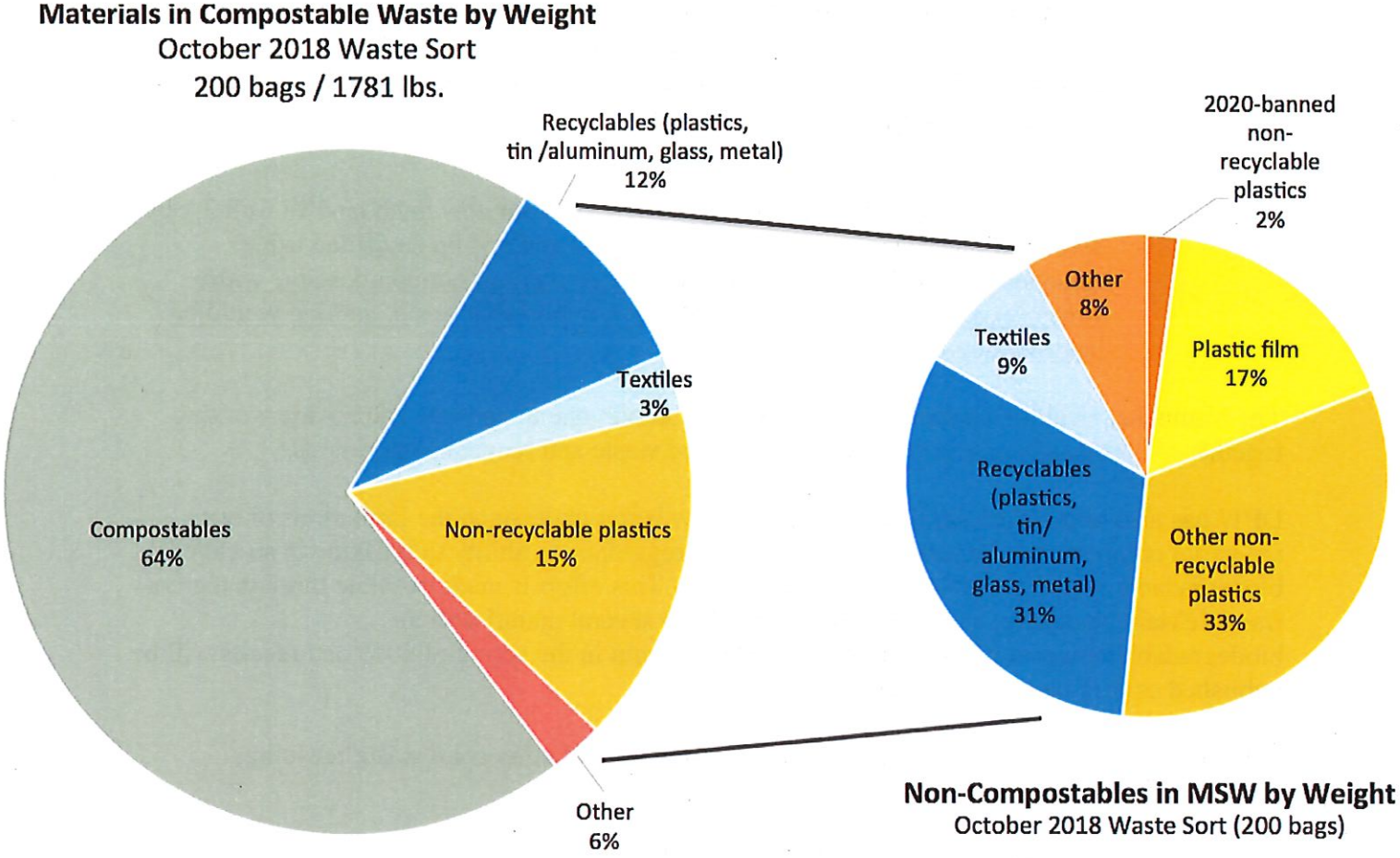
Nantucket Solid Waste/Recycling Facility - *Industrial Composter Air-Floor with a view of the initially screened compost on the left (with visible bits of plastic and other debris) and baled residuals on the right (mostly larger-sized plastics contaminated with compost). March 2019*

Consequently, the compost is contaminated with small bits of glass and plastic, rendering our compost material less than desirable, without more costly screening/processing. Another consequence of material contamination in the compostable stream is that the screened off and baled residuals still contain compostable material that the trommel could not separate. These composter facility residuals were noticed to also contain substantial quantities of recyclable materials that are no longer recoverable at this point. It is important to note that our compost facility residuals are the only materials that are landfilled.

It follows that the residuals being baled and sent to our landfill contain excessive amounts of compostable and recyclable materials. This is both inefficient use of scarce landfill space and a lost opportunity to generate revenue from sale of compost or recyclables. There is no simple or inexpensive method to upgrade our compost facility to address these significant limitations.

To better understand the levels of contamination in our compostable waste stream DPW, WON, ReMain Nantucket, and college students from Worcester Polytechnic Institute (WPI) conducted our first waste characterization study in October 2018. A 200-bag sample (100 bags from our residential drop-off and 100 bags from a randomly selected residential neighborhood delivered by a private hauler) was opened and sorted. Results confirmed the excessive levels of

contamination of our compostable waste stream with only 64% of the sample was found to be compostable! Of the remaining 36%, the majority was found to be non-recyclable plastics, then recoverable recyclables, film plastics, textiles, electronics and other materials, and finally the locally banned non-recyclable plastics (such as K-cups) (See Figure 1). This level of contamination is expected to climb during the summer tourist season, and DPW with WON will conduct another waste sort in July or August of 2019.



Materials in Compostable Waste by Weight	
Compostable waste	1229.75 lbs
Recyclable waste (plastics, tin/ aluminum, glass, metal)	173.85 lbs
Other non-recyclable plastics	179.75 lbs
Plastic film	93.0 lbs
Textiles	48.5 lbs
Other	44.5 lbs
2020-banned non-recyclable plastics	12.0 lbs
Total	**1781.35 lbs**

FIGURE 1: October 2018 Waste Characterization Results

The data collected during our first waste characterization study drove the recent changes to our waste stream management with a focus on cleaning up the compostable waste stream to:

1. Maximize our conformance with MADEP waste ban regulations (ie. Maximize recovery of our recyclables and realize their revenue potential.)

2. Enhance the quality of our compost being produced that will directly support its marketability and realize the revenue potential. Salable local compost has the potential to lessen our island's reliance on importing compost which also impacts boat space availability.

3. Extend the expected life (currently 10 years) of our new lined landfill Cell 3A by diverting materials that contaminate compost and end up landfilled using reasonable, cost effective alternatives. Effectively, if our compostable waste stream were 100% clean and free of non-compostable waste, nothing would be landfilled on Nantucket.

The Nantucket Health Department, DPW, WON, and our island's private haulers are working together to continually assess and improve our solid waste and recycling operations.

DPW has also undertaken another ongoing effort to better understand the limitations of our industrial composter and overall compost systems regarding its ability to breakdown so-called biodegradable or compostable plant-based plastics. This effort is made possible through a grant from ReMain Nantucket and with participation from several manufacturers' biodegradable/compostable products. Testing will begin in the spring of 2019 and results will be published as they become available.

In the last year, DPW has advanced and/or supported several other solid waste/recycling initiatives including:

- The island's first coastal plastics study.
- Mailed notifications in reference to Town Code Section 125-4 *Transport of Solid Waste to Disposal Facility* to all island private haulers currently licensed by the Health Department regarding improper securing of their loads and the direct relationship to unnecessary roadside trash, including the potential to be fined.
- Mailed notifications in reference to Town Code Section 125-7 *Trash barrels and containers; restricted use* to over 50 offenders who illegally dumped household or commercial garbage into public Town trash receptacles.
- Introduced clarifying signage on public waste receptacles to identify their proper waste stream AND to notify users about the Town Code prohibiting dumping of household and commercial trash into public waste receptacles.
- Researched and made recommendations (that the Selectboard unanimously adopted) increasing the access of Household Hazardous Waste collection to commercial entities that classify as Very Small Quantity Generators (VSQG's).
- Next MassSave appliance recycling event April 6, 2019.

- Island's first annual Litter Derby April 14, 2019 at Bartlett's Farm.
- Nantucket Clean Team resumes April 27, 2019.

Future research and recommendations from the environmental leadership focus group is expected to include our fee structure analysis, private hauler regulations, Pay As You Throw (PAYT) programs (with reference to the Wannaccomet Water Company example from 1961 when they moved from a flat rate to a metered useage/billing system).

Please call me at (508) 228-7244 if you have questions regarding this information.

Very Truly Yours,

Robert D. McNeil III, P.E.
Director

Attachment: FY2018, Summary or Costs and Credits

Cc: C. Elizabeth Gibson, Town Manager
Brian E. Turbitt, Finance Director
Graeme Durovich, Solid Waste & Recycling Coordinator
George Aronson, CRMC
Janet Schulte, Strategic Planning Coordinator
Strategic Planning - Environmental Leadership Focus Group

FY2018 – Nantucket Solid Waste Enterprise Fund (SWEF) Summary of Costs/Credits				
Item	Quantity	Unit	Rate	Amount
MSW[1]	23000	tons	$ (127.66)	$ (2,936,180.00)
Leaf & Yard Waste	10478.97	tons	$ (40.00)	$ (419,158.80)
C&D/Bulky/Take-It-or-Leave-It Waste	2584.22	tons	$ (199.94)	$ (516,688.95)
Diverted Clean Wood	887.1	tons	$ (100.00)	$ (88,710.00)
Mixed Excavation Waste	8989.31	tons	$ (85.00)	$ (764,091.35)
Mixed Excavation Waste	2220.72	tons	$ (55.00)	$ (122,139.60)
Mixed Excavation Waste	317.99	tons	$ (30.00)	$ (9,539.70)
HTMW Disposal (mattress, tire, and e-waste recycling, Freon removal)	6930.14	tons	Various	$ (396,022.36)
Off-Island Disposal Reimbursements to WON			Various	$ (1,455,744.10)
C&D Facility Fees	12	months	$ (31,725.33)	$ (380,703.96)
C&D Handling Fees	12	months	$ (49,986.12)	$ (599,833.44)
MRF Fees	12	months	$ (33,323.92)	$ (399,887.04)
Sludge Management Fees	12	months	$ (19,225.33)	$ (230,703.96)
Scrap Metal Scalehouse Tip Fees	134.65	tons	$ 142.00	$ 19,120.30
Wood Scalehouse Tip Fees	254.03	tons	$ 142.00	$ 36,072.26
Brush Scalehouse Tip Fees	3209.75	tons	$ 142.00	$ 455,784.50
Asphalt, brick, Concrete Scalehouse Tip Fees	201.28	tons	$ 142.00	$ 28,581.76
Mixed Excavation Waste Scalehouse Tip Fees	7897.29	tons	$ 30.00	$ 236,918.70

Construction & Demolition Scalehouse Tip Fees[2]	6933.16	tons	$ 372.00	$ 2,054,197.40
Cardboard Recyclables Credit[3]	752.28	tons	Market rate	$ 33,500.36
Tin Recyclables Credit[3]	34.68	tons	Market rate	$ 1,298.34
Aluminum Recyclables Credit[3]	47.79	tons	Market rate	$ 22,213.42
Paper Recyclables Credit[3]	12.78	tons	Market rate	$ 136.06
Plastics Recyclables Credit[3]	238.14	tons	Market rate	$ (5,317.46)
Cost for Transport of Recyclables to: Miller Recycling[4]	34	loads	$ (375.00)	$ (12,750.00)
Costs for Transport of Recyclables to: Office Paper Recovery[4]	13	loads	$ (450.00)	$ (5,850.00)
Mulch Credit	263	CY	$ 5.00	$ 1,315.00
Topsoil Credit	495	CY	$ 7.50	$ 3,712.50
Compost Credit	117	CY	$ 5.00	$ 585.00
TOTAL				$ (5,449,885.13)

Notes:

[1] TON pays for 23,000 tons of MSW per year according to the Waste Services Agreement

[2] Discounted tip fee rates for certain large generators

[3] This amount represents only the TON's 50% portion of the net credit

[4] This amount represents only the TON's 50% portion of the cost to transport recyclables